

AMENDMENTS TO THE CLAIMS

1. (CURRENTLY AMENDED) A method of compensating a data writing process in an optical disc data storage channel, the method comprising:

deriving a write strategy matrix by adjusting elements of  
5 the write strategy matrix to reduce a difference between output  
data recovered from the optical disc data storage channel and data  
transformed using a target channel model, wherein the write  
strategy matrix maps a plurality of input sequences to a plurality  
of write strategy parameters, the input sequences each including a  
10 plurality of input data elements;

receiving an input sequence; and

using the write strategy matrix to determine a selected  
write strategy parameter that corresponds to the input sequence.

2. (ORIGINAL) A method of compensating as recited in  
claim 1 wherein the write strategy parameters are configured to  
control the time course of writing laser pulses.

3. (ORIGINAL) A method of compensating as recited in  
claim 1 wherein the optical disc is an optical phase change disc.

4. (ORIGINAL) A method of compensating as recited in claim 1 wherein each input sequence corresponds to a set of write strategy parameters.

5. (ORIGINAL) A method of compensating as recited in claim 1 wherein the input sequence consists of three data elements.

6. (ORIGINAL) A method of compensating as recited in claim 1 wherein the write strategy matrix is derived so that detected signal transitions in the output from the optical disc data storage channel are adjusted to occur at desired points in time.

7. (ORIGINAL) A method of improving a write strategy matrix that maps a plurality of input sequences to a plurality of write strategy parameters, the input sequences each including a plurality of input data elements, the method comprising:

5 writing a set of input sequences to an optical data storage channel using the write strategy matrix;

transforming the set of input sequences using a target channel model to obtain transformed data;

recovering output data from the optical data storage  
10 channel;

comparing the recovered output data to the transformed input data to determine a difference between the recovered output data and the transformed input data; and

15 adjusting the write strategy matrix to decrease the difference between the recovered output data and the transformed input data.

8. (CURRENTLY AMENDED) A method of compensating as recited in claim 1 wherein the write strategy matrix is derived so that detected signal levels are adjusted.

9. (ORIGINAL) A method of improving a write strategy matrix as recited in claim 7 wherein the target channel model is a fixed channel model.

10. (ORIGINAL) A method of improving a write strategy matrix as recited in claim 7 wherein the target channel model is a dynamic channel model.

11. (ORIGINAL) A method of improving a write strategy matrix as recited in claim 7 wherein the target channel model is a linear channel model.

12. (ORIGINAL) A method of improving a write strategy matrix as recited in claim 7 wherein the target channel model is a linear dynamic channel model.

13. (ORIGINAL) A method of improving a write strategy matrix as recited in claim 7 further including adjusting the target channel model to increase the similarity of the transformed input data to the recovered output data.

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14. (ORIGINAL) A method of improving a write strategy matrix as recited in claim 7 wherein adjusting the write strategy matrix to decrease the difference between the recovered output data and the transformed input data includes adjusting the write strategy matrix by a fixed amount.

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15. (ORIGINAL) A method of improving a write strategy matrix as recited in claim 7 wherein adjusting the write strategy matrix to decrease the difference between the recovered output data and the transformed input data includes adjusting the write strategy matrix by an amount that is determined by the difference between the recovered output data and the transformed input data.

16. (ORIGINAL) A method of improving a write strategy matrix as recited in claim 7 wherein adjusting the write strategy

matrix to decrease the difference between the recovered output data and the transformed input data includes adjusting the write strategy matrix by a plurality of amounts and determining which of the plurality of amounts decreases the difference between the recovered output data and the transformed input data most effectively.

17. (ORIGINAL) A method of improving a write strategy matrix as recited in claim 7 wherein adjusting the write strategy matrix to decrease the difference between the recovered output data and the transformed input data includes adjusting the write strategy matrix by a plurality of amounts and determining which of the plurality of amounts decreases the difference between the recovered output data and the transformed input data by the greatest amount.

18. (ORIGINAL) A method of deriving a write strategy matrix that maps a plurality of input sequences to a plurality of write strategy parameters, the input sequences each including a plurality of input data elements, the method comprising:

5 writing a first input sequence to an optical data storage channel;

recovering a first sequence of output data from the optical data storage channel;

using the first sequence of output data to map the  
10 plurality of data elements to a plurality of initial write strategy  
parameters;

writing a second input sequence to the optical data  
storage channel using the initial write strategy parameters, the  
second input sequence including a plurality of subsequences;

15 recovering a second sequence of output data from the  
optical data storage channel;

using the second sequence of output data to map the  
plurality of subsequences to the plurality of write strategy  
parameters.

19. (ORIGINAL) A method of deriving a write strategy  
matrix as recited in claim 18 wherein the first input sequence is  
configured to determine the dynamic range of the optical data  
storage channel and wherein the plurality of initial write strategy  
5 parameters are configured to use less than the entire dynamic range  
of the optical data storage channel.

20. (ORIGINAL) A method of deriving a write strategy  
matrix as recited in claim 18 wherein the first sequence is  
configured to control intersymbol interference.

21. (ORIGINAL) A method of deriving a write strategy matrix as recited in claim 18 wherein the first sequence includes a series of repeated symbols.

22. (ORIGINAL) A method of deriving a write strategy matrix as recited in claim 18 wherein the plurality of subsequences have a given length and wherein the plurality of subsequences include all possible subsequences of the given length.

23. (ORIGINAL) A method of deriving a write strategy matrix as recited in claim 22 wherein the given length is three.

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24. (ORIGINAL) A method of deriving a write strategy matrix as recited in claim 18 wherein the plurality of subsequences have a given length and wherein the second sequence include all possible subsequences of a length that is greater than the given length.

25. (ORIGINAL) A method of deriving a write strategy matrix as recited in claim 24 wherein the given length is three and the length that is greater than the given length is five.

26. (ORIGINAL) A method of deriving a write strategy matrix as recited in claim 18 wherein the initial write strategy

parameters are derived such that three or more output levels corresponding to the input data elements are evenly spaced.

27. (ORIGINAL) A method of deriving a write strategy matrix as recited in claim 18 wherein the initial write strategy parameters are derived such that three or more output levels corresponding to the input data elements are spaced based on the variance of the distribution of the output data in the first sequence of output data about the output levels.  
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28. (CURRENTLY AMENDED) A method of deriving a write strategy matrix that maps a plurality of input sequences to a plurality of write strategy parameters, the input sequences each including a plurality of input data elements, comprising:

5 writing an input sequence to an optical data storage channel, the input sequence including a plurality of subsequences; recovering a sequence of output data from the optical data storage channel;

10 using the sequence of output data to adjust a map of the plurality of subsequences to the plurality of write strategy parameters according to a difference between the sequence of output data and data transformed using a target channel model.

29. (ORIGINAL) A method of deriving a write strategy matrix as recited in claim 28 wherein the plurality of subsequences have a given length and wherein the plurality of subsequences include all possible subsequences of the given length.

30. (ORIGINAL) A method of deriving a write strategy matrix as recited in claim 28 wherein the plurality of subsequences have a given length and wherein the input sequence includes all possible subsequences of a length that is greater than the given  
5 length.

31. (CURRENTLY AMENDED) A method of improving a write strategy matrix that maps a plurality of input sequences to a plurality of write strategy parameters, the input sequences each including a plurality of input data elements, comprising:

5 transforming the set of input sequences using a target channel model to obtain a first set of transformed data;

transforming the set of input sequences using a simulated channel model to obtain a second set of transformed data;

comparing the first set of transformed data to the second  
10 set of transformed data to determine a difference between the first set of transformed data to the second set of transformed data; and

adjusting the write strategy matrix to decrease the difference between the first set of transformed data to the second set of transformed data.

32. · (ORIGINAL) A method of improving a write strategy matrix as recited in claim 31 wherein the simulated channel model is obtained by writing a set of input sequences to an optical data storage channel using the write strategy matrix and recovering  
5 output data from the optical data storage channel.

33. (CURRENTLY AMENDED) A method of improving a write strategy matrix that maps a plurality of input sequences to a plurality of write strategy parameters, the input sequences each including a plurality of input data elements, the method comprising:

writing ~~a set of~~ an input sequences sequence to an optical data storage channel using the write strategy matrix;

transforming the ~~set of~~ input sequences sequence using a target channel model to obtain transformed data;

10 recovering output data from the optical data storage channel;

comparing the recovered output data to the transformed input data to determine a difference between the recovered output data and the transformed input data; and

15                         adjusting the write strategy matrix to decrease the difference between the recovered output data and the transformed input data.

34. (CURRENTLY AMENDED) A system for compensating a data writing process in an optical disc data storage channel, the system comprising:

a data input for receiving an input sequences sequence;

5                         a write strategy matrix configured to reduce a difference between recovered output data from the optical disc data storage channel and data transformed using a target channel model, wherein the write strategy matrix maps a plurality of input sequences to a plurality of write strategy parameters, the input sequences each including a plurality of input data elements; and

10                         an output for outputting a selected write strategy parameter that corresponds to the input sequence.

35. (ORIGINAL) A system as recited in claim 34 wherein the write strategy parameters are configured to control the time course of writing laser pulses.

36. (ORIGINAL) A system as recited in claim 34 wherein the optical disc is an optical phase change disc.

37. (ORIGINAL) A system as recited in claim 34 wherein each input sequence corresponds to a set of write strategy parameters.

38. (ORIGINAL) A system as recited in claim 34 wherein the input sequence consists of three data elements.

39. (ORIGINAL) A system as recited in claim 34 wherein the write strategy matrix is derived so that detected signal transitions in the output from the optical disc data storage channel are adjusted to occur at desired points in time.

40. (ORIGINAL) A system as recited in claim 34 wherein the write strategy matrix is derived so that detected signal levels in the output from the optical disc data storage channel are adjusted.

41. (CURRENTLY AMENDED) A system for improving a write strategy matrix that maps a plurality of input sequences to a plurality of write strategy parameters, the input sequences each including a plurality of input data elements, the system comprising:

a writer configured to write a set of input sequences to an optical data storage channel using the write strategy matrix;

a target channel model for transforming the set of input sequences to obtain transformed data;

10 a reader configured to recover output data from the optical data storage channel; and

15 a processor configured to ~~comparing~~ compare the recovered output data to the transformed input data to determine a difference between the recovered output data and the transformed input data and adjust the write strategy matrix to decrease the difference between the recovered output data and the transformed input data.

42. (ORIGINAL) A system as recited in claim 41 wherein the target channel model is a fixed channel model.

43. (ORIGINAL) A system as recited in claim 41 wherein the target channel model is a dynamic channel model.

44. (ORIGINAL) A system as recited in claim 41 wherein the target channel model is a linear channel model.

45. (ORIGINAL) A system as recited in claim 41 wherein the target channel model is a linear dynamic channel model.

46. (ORIGINAL) A system as recited in claim 41 further including a second processor configured to adjust the target

channel model to increase the similarity of the transformed input data to the recovered output data.

47. (ORIGINAL) A system as recited in claim 41 wherein the first processor is further configured to adjust the target channel model to increase the similarity of the transformed input data to the recovered output data.

48. (ORIGINAL) A system as recited in claim 41 wherein the write strategy matrix is adjusted by a fixed amount.

49. (ORIGINAL) A system as recited in claim 41 wherein the write strategy matrix is adjusted by an amount that is determined by the difference between the recovered output data and the transformed input data.

50. (ORIGINAL) A system as recited in claim 41 wherein the write strategy matrix is adjusted by a plurality of amounts and it is determined which of the plurality of amounts decreases the difference between the recovered output data and the transformed  
5 input data most effectively.

51. (ORIGINAL) A system as recited in claim 41 wherein the write strategy matrix is adjusted by a plurality of amounts and

it is determined which of the plurality of amounts decreases the difference between the recovered output data and the transformed  
5 input data by the greatest amount.

52. (CURRENTLY AMENDED) A system for deriving a write strategy matrix that maps a plurality of input sequences to a plurality of write strategy parameters, the input sequences each including a plurality of input data elements, comprising:

5 a writer configured to ~~writing~~ write an input sequence to an optical data storage channel, the input sequence including a plurality of subsequences;

a reader configured to ~~for recovering~~ recover a sequence of output data from the optical data storage channel; and

10 a processor ~~for using~~ configured to use the sequence of output data to adjust a map of the plurality of subsequences to the plurality of write strategy parameters according to a difference between the sequence of output data and data transformed using a target channel model.

53. (ORIGINAL) A system as recited in claim 52 wherein the plurality of subsequences have a given length and wherein the plurality of subsequences include all possible subsequences of the given length.

54. (ORIGINAL) A system as recited in claim 52 wherein the plurality of subsequences have a given length and wherein the input sequence includes all possible subsequences of a length that is greater than the given length.

55. (CURRENTLY AMENDED) A system for improving a write strategy matrix that maps a plurality of input sequences to a plurality of write strategy parameters, the input sequences each including a plurality of input data elements, the system comprising:

an input configured to receiving a set of input sequences; and

a processor configured to to (i) transform the set of input sequences using a target channel model to obtain a first set of transformed ~~data~~ data, (ii) transform the set of input sequences using a simulated channel model to obtain a second set of transformed ~~data~~ data, (iii) compare the first set of transformed data to the second set of transformed data to determine a difference between the first set of transformed data to the second set of transformed ~~data~~ data and (iv) adjust the write strategy matrix to decrease the difference between the first set of transformed data and the second set of transformed data.

56. (ORIGINAL) A system as recited in claim 55 wherein  
the simulated channel model is obtained by writing a set of input  
sequences to an optical data storage channel using the write  
strategy matrix and recovering output data from the optical data  
5 storage channel.

57. (ORIGINAL) A system for improving a write strategy  
matrix that maps a plurality of input sequences to a plurality of  
write strategy parameters, the input sequences each including a  
plurality of input data elements, comprising:

5           a writer configured to write a set of input sequences to  
an optical data storage channel using the write strategy matrix;  
  
              a reader configured to recover output data from the  
optical data storage channel; and  
  
              a processor configured to transform the set of input  
10      sequences using a target channel model to obtain transformed data,  
to compare the recovered output data to the transformed input data,  
to determine a difference between the recovered output data and the  
transformed input data and to adjust the write strategy matrix to  
decrease the difference between the recovered output data and the  
15      transformed input data.

58. (NEW) A method of compensating a data writing process in an optical disc data storage channel, the method comprising:

5 deriving a write strategy matrix wherein the write strategy matrix maps a plurality of input sequences to a plurality of write strategy parameters, the input sequences each consist of three input data elements;

receiving an input sequence; and

10 using the write strategy matrix to determine a selected write strategy parameter that corresponds to the input sequence.

59. (NEW) A system for compensating a data writing process in an optical disc data storage channel, the system comprising:

a data input for receiving an input sequence;

5 a write strategy matrix wherein the write strategy matrix maps a plurality of input sequences to a plurality of write strategy parameters, the input sequences each consisting of three input data elements; and

an output for outputting a selected write strategy parameter that corresponds to the input sequence.